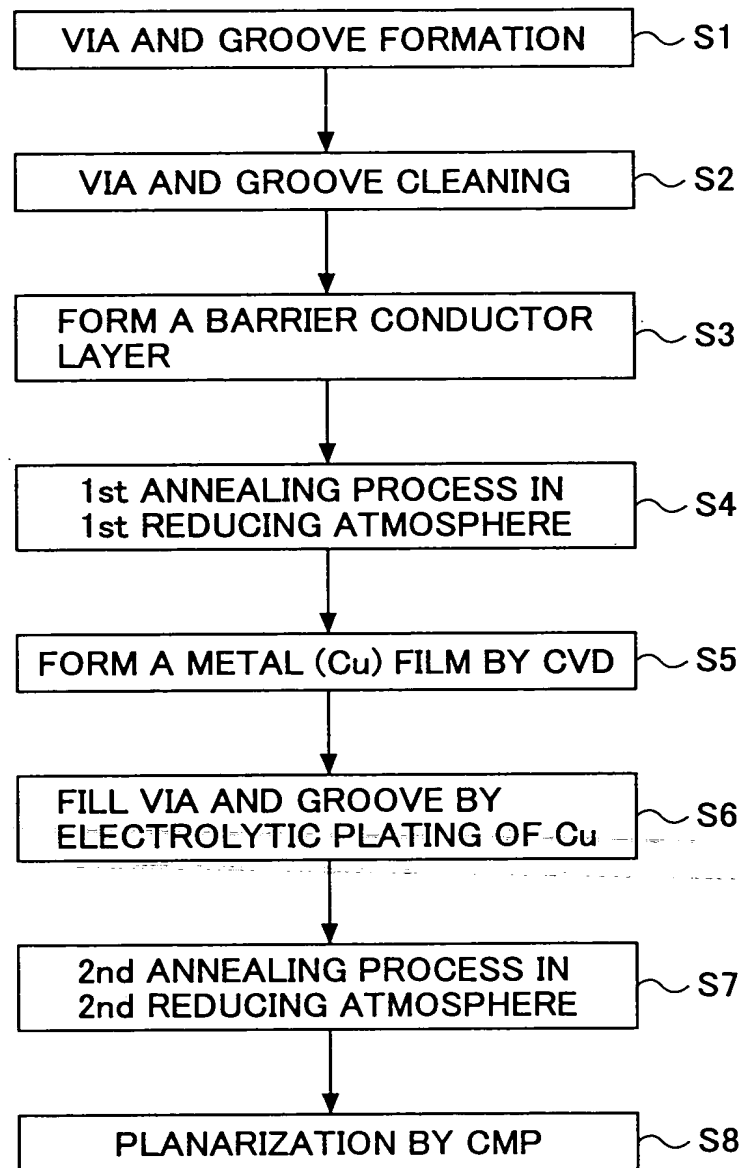


FIG.1



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FIG. 2

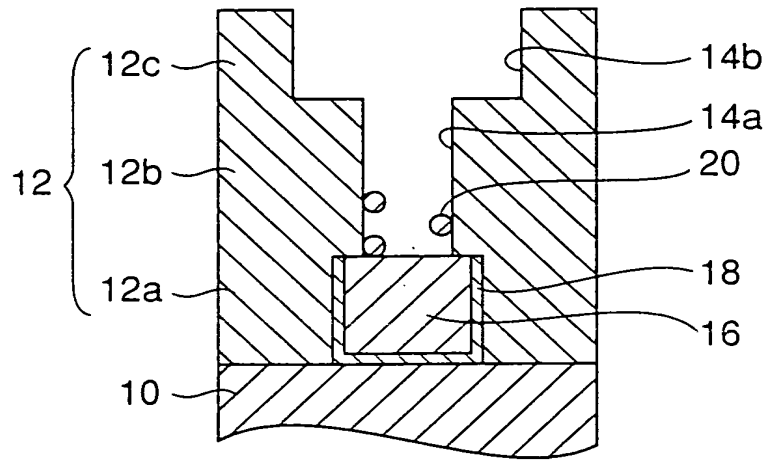


FIG. 3

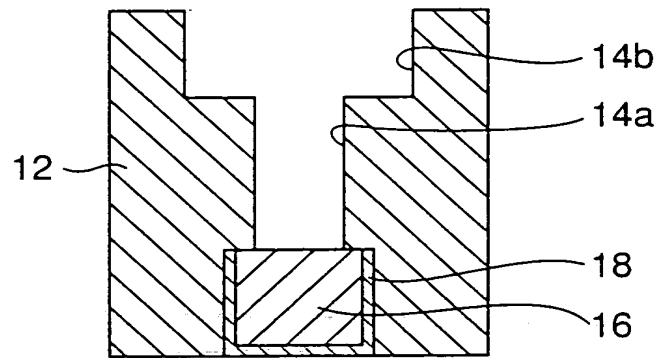


FIG. 4

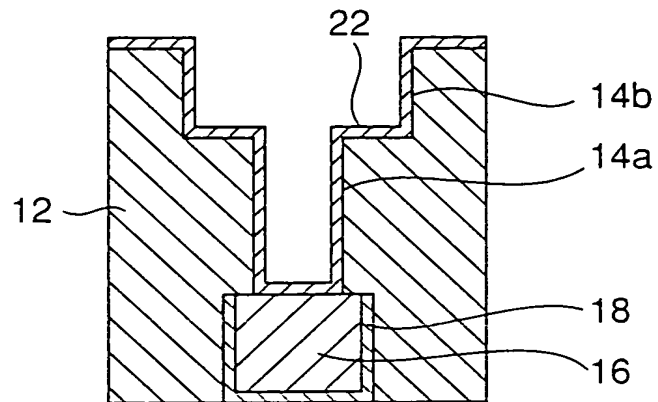


FIG. 5

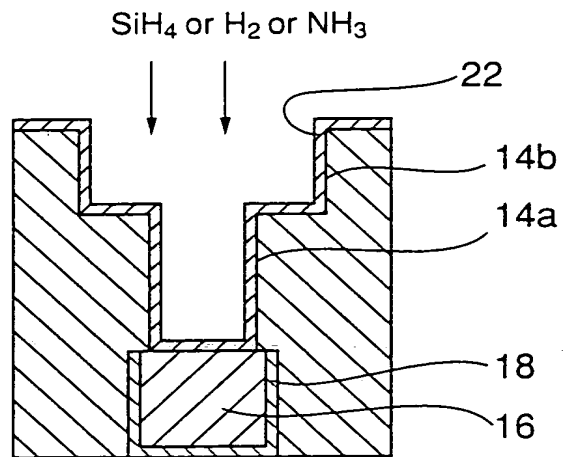


FIG. 6

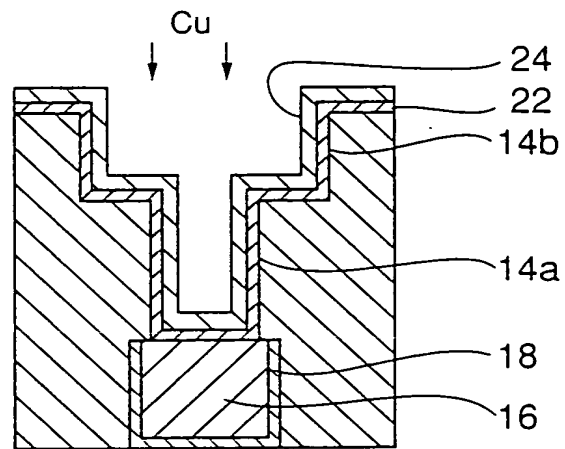


FIG. 7

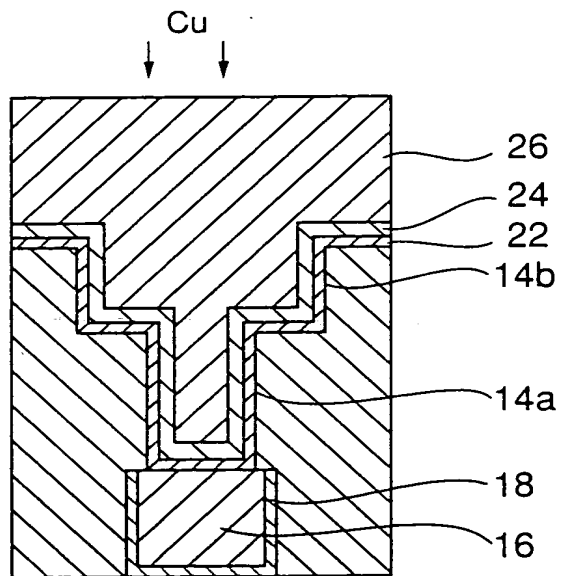


FIG. 8

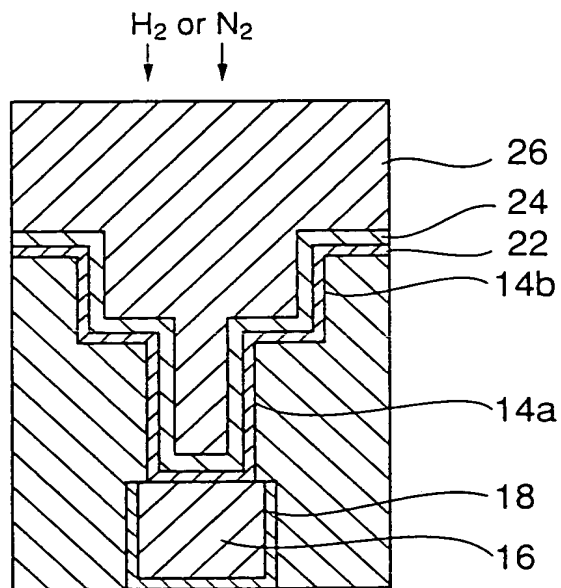


FIG. 9

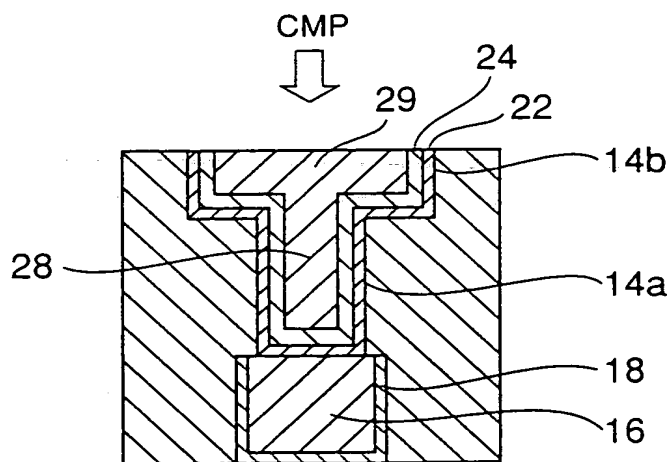
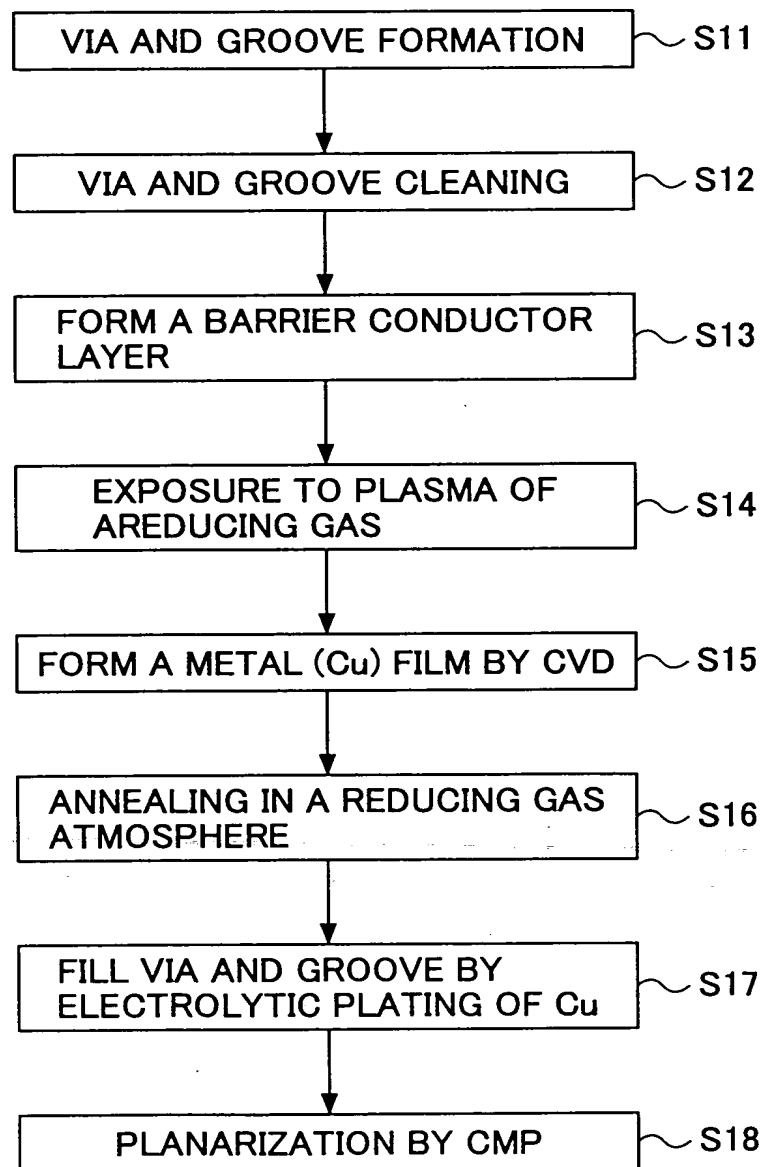


FIG.10



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FIG. 11

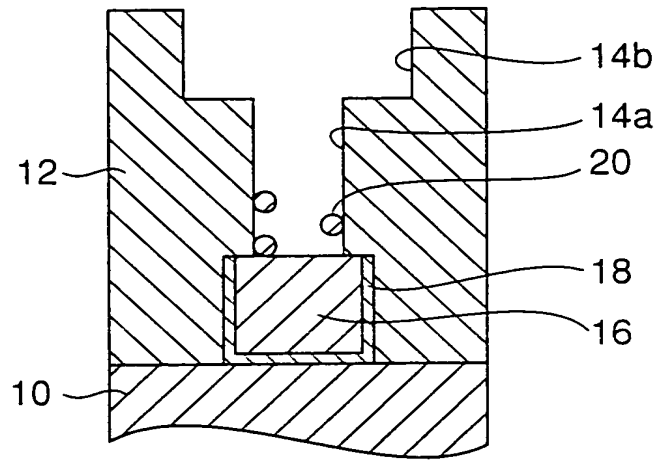


FIG. 12

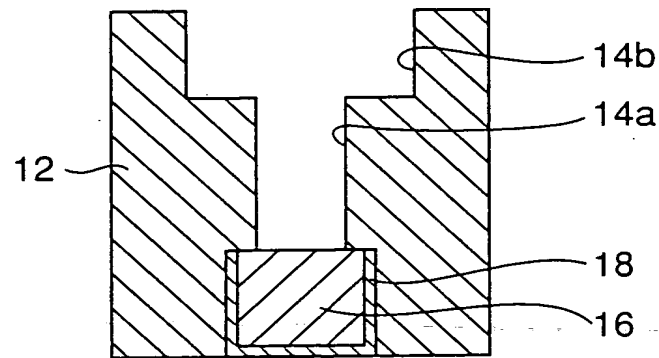


FIG. 13

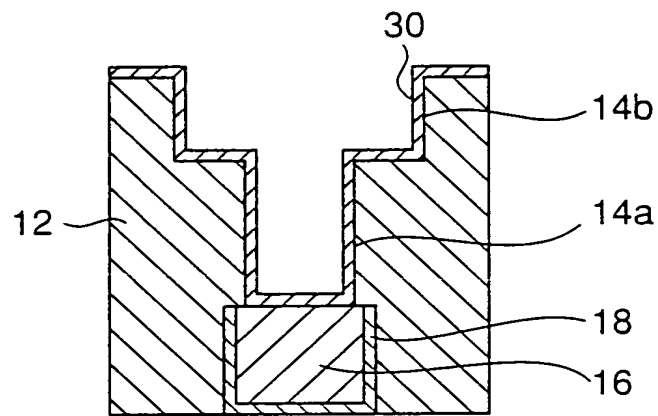


FIG. 14

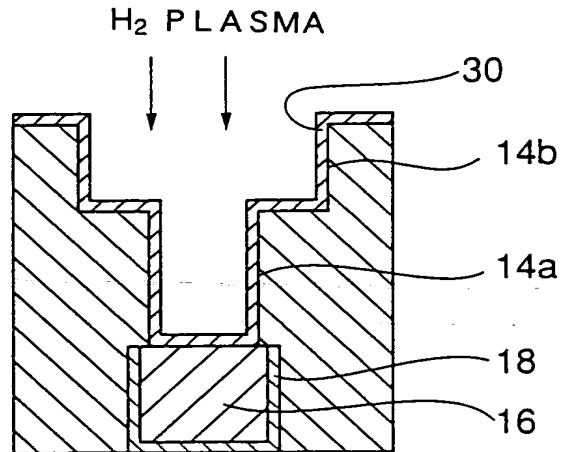




FIG. 15

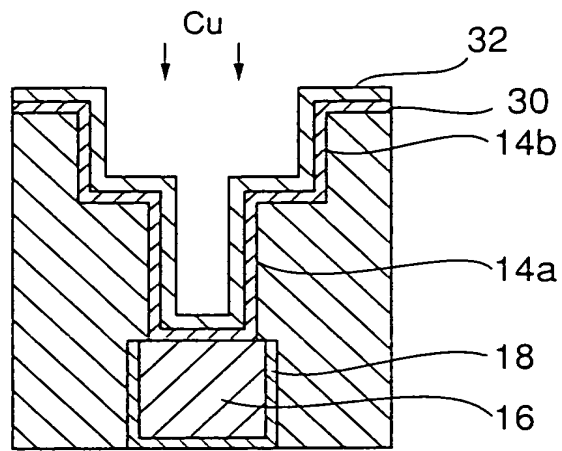
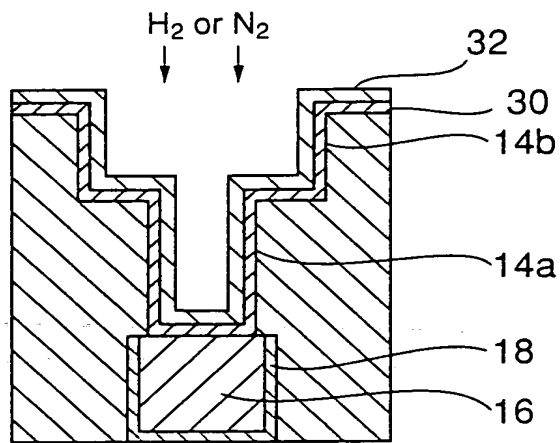


FIG. 16



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FIG. 17

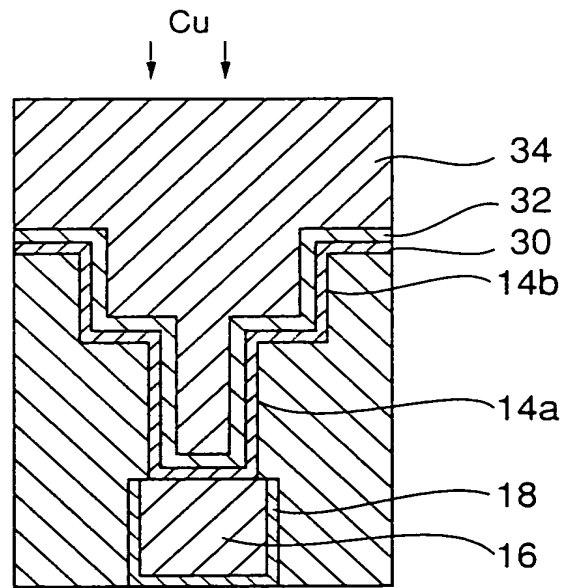


FIG. 18

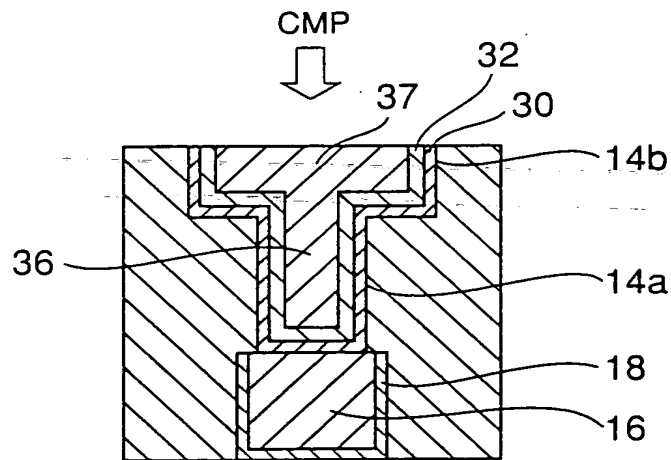


FIG.19

	BARRIER CONDUCTOR	METAL FILM	1st ANNEAL GAS	2nd ANNEAL GAS	PLASMA GAS	TAPE TEST	STRENGTH TEST (MPa)
EXP1	TaN(PVD)	Cu(CVD)	NH <sub>3</sub>	H <sub>2</sub>	—	O	68
EXP2	TaN(PVD)	Cu(CVD)	SiH <sub>4</sub>	H <sub>2</sub>	—	O	74
EXP3	TaN(PVD)	Cu(CVD)	H <sub>2</sub>	H <sub>2</sub>	—	O	69
EXP4	WN(CVD)	Cu(CVD)	SiH <sub>4</sub>	H <sub>2</sub>	—	O	64
EXP5	WN(CVD)	Cu(CVD)	—	—	H <sub>2</sub>	O	75
COMP1	TaN(PVD)	Cu(CVD)	—	—	—	x	31
COMP2	TaN(PVD)	Cu(CVD)	—	H <sub>2</sub>	—	x	44
COMP3	TaN(PVD)	Cu(CVD)	NH <sub>3</sub>	—	—	x	—
COMP4	TaN(PVD)	Cu(CVD)	SiH <sub>4</sub>	—	—	x	—
COMP5	TaN(PVD)	Cu(CVD)	H <sub>2</sub>	—	—	x	—
REF	TaN(PVD)	Cu(PVD) +Cu(CVD)	—	H <sub>2</sub>	—	O	69

FIG. 20

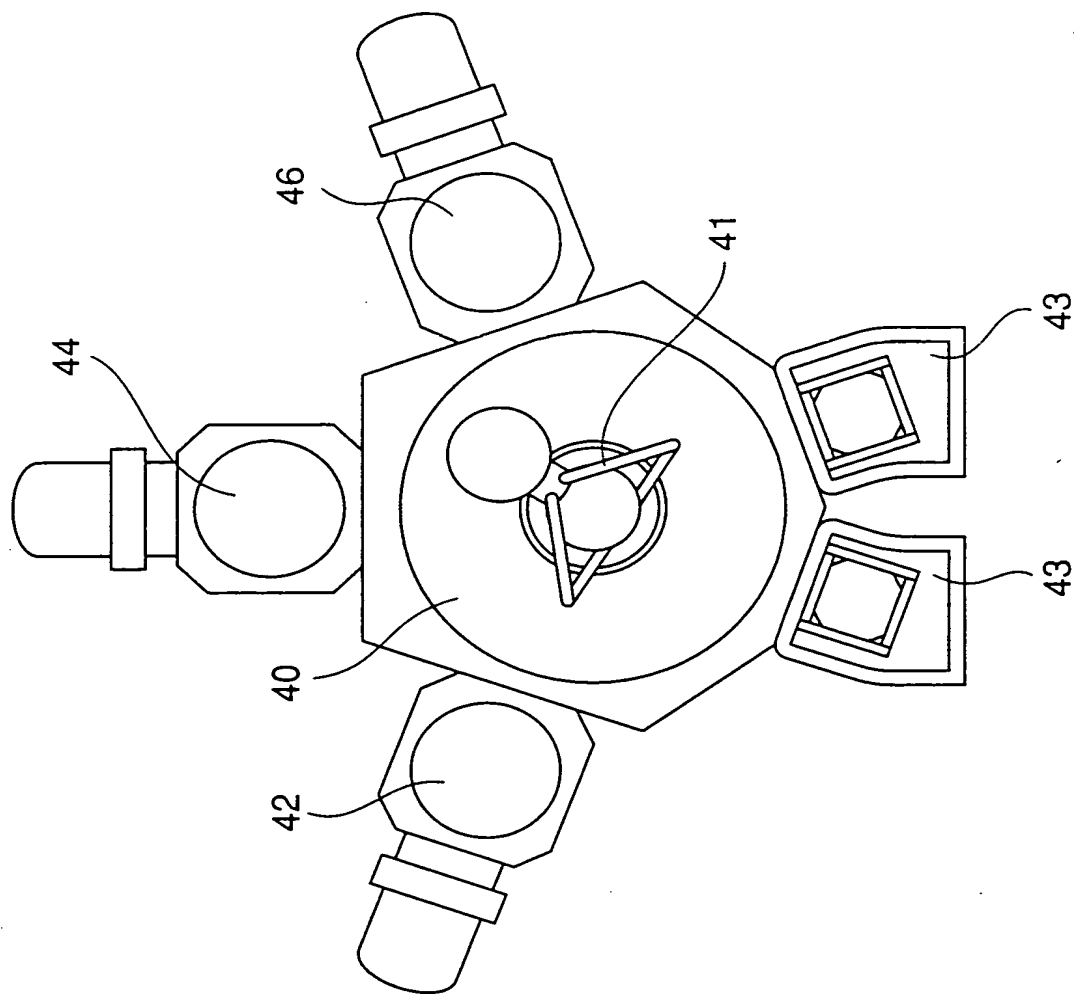


FIG.21

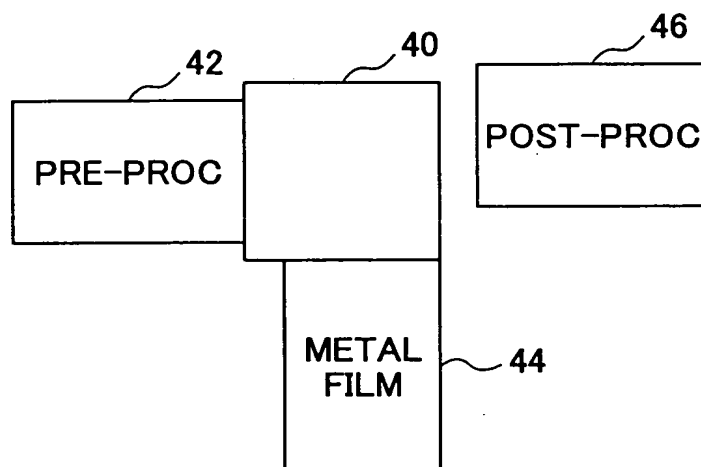
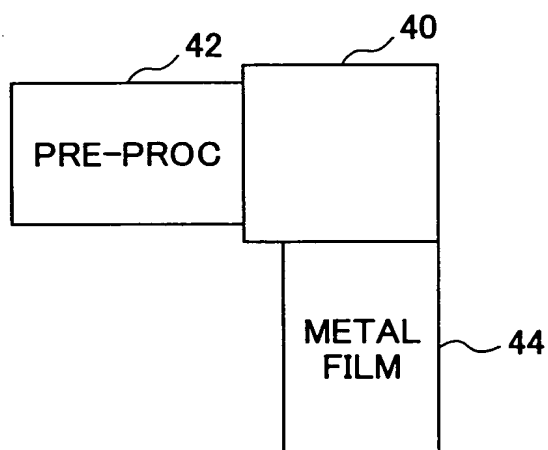


FIG.22



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FIG.23

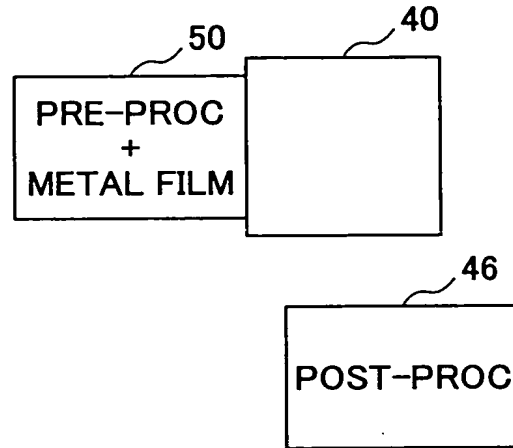


FIG.24

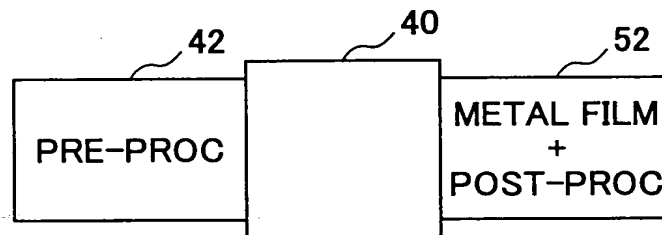


FIG.25

